

## CLAIMS

We claim:

1. An isolated nucleic acid molecule comprising

(a) a nucleic acid molecule comprising a nucleic acid sequence that encodes

5 an amino acid sequence of SEQ ID NO: 165 through 280;

(b) a nucleic acid molecule comprising a nucleic acid sequence of SEQ ID

NO: 1 through 164;

(c) a nucleic acid molecule that selectively hybridizes to the nucleic acid  
molecule of (a) or (b); or

10 (d) a nucleic acid molecule having at least 60% sequence identity to the nucleic  
acid molecule of (a) or (b).

2. The nucleic acid molecule according to claim 1, wherein the nucleic acid  
molecule is a cDNA.

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3. The nucleic acid molecule according to claim 1, wherein the nucleic acid  
molecule is genomic DNA.

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4. The nucleic acid molecule according to claim 1, wherein the nucleic acid  
molecule is a mammalian nucleic acid molecule.

5. The nucleic acid molecule according to claim 4, wherein the nucleic acid  
molecule is a human nucleic acid molecule.

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6. A method for determining the presence of a breast specific nucleic acid  
(BSNA) in a sample, comprising the steps of:

(a) contacting the sample with the nucleic acid molecule according to claim 1  
under conditions in which the nucleic acid molecule will selectively hybridize to a breast  
specific nucleic acid; and

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(b) detecting hybridization of the nucleic acid molecule to a BSNA in the  
sample, wherein the detection of the hybridization indicates the presence of a BSNA in  
the sample.

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7. A vector comprising the nucleic acid molecule of claim 1.

8. A host cell comprising the vector according to claim 7.

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9. A method for producing a polypeptide encoded by the nucleic acid molecule according to claim 1, comprising the steps of (a) providing a host cell comprising the nucleic acid molecule operably linked to one or more expression control sequences, and (b) incubating the host cell under conditions in which the polypeptide is produced.

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10. A polypeptide encoded by the nucleic acid molecule according to claim 1.

11. An isolated polypeptide selected from the group consisting of:

(a) a polypeptide comprising an amino acid sequence with at least 60%

15 sequence identity to of SEQ ID NO: 165 through 280; or

(b) a polypeptide comprising an amino acid sequence encoded by a nucleic acid molecule comprising a nucleic acid sequence of SEQ ID NO: 1 through 164.

12. An antibody or fragment thereof that specifically binds to the polypeptide  
20 according to claim 11.

13. A method for determining the presence of a breast specific protein in a sample, comprising the steps of:

(a) contacting the sample with the antibody according to claim 12 under

25 conditions in which the antibody will selectively bind to the breast specific protein; and

(b) detecting binding of the antibody to a breast specific protein in the sample, wherein the detection of binding indicates the presence of a breast specific protein in the sample.

30 14. A method for diagnosing and monitoring the presence and metastases of breast cancer in a patient, comprising the steps of:

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(a) determining an amount of the nucleic acid molecule of claim 1 or a polypeptide of claim 6 in a sample of a patient; and

(b) comparing the amount of the determined nucleic acid molecule or the polypeptide in the sample of the patient to the amount of the breast specific marker in a normal control; wherein a difference in the amount of the nucleic acid molecule or the polypeptide in the sample compared to the amount of the nucleic acid molecule or the polypeptide in the normal control is associated with the presence of breast cancer.

15. A kit for detecting a risk of cancer or presence of cancer in a patient, said kit comprising a means for determining the presence the nucleic acid molecule of claim 1 or a polypeptide of claim 6 in a sample of a patient.

16. A method of treating a patient with breast cancer, comprising the step of administering a composition according to claim 12 to a patient in need thereof, wherein said administration induces an immune response against the breast cancer cell expressing the nucleic acid molecule or polypeptide.

17. A vaccine comprising the polypeptide or the nucleic acid encoding the polypeptide of claim 11.